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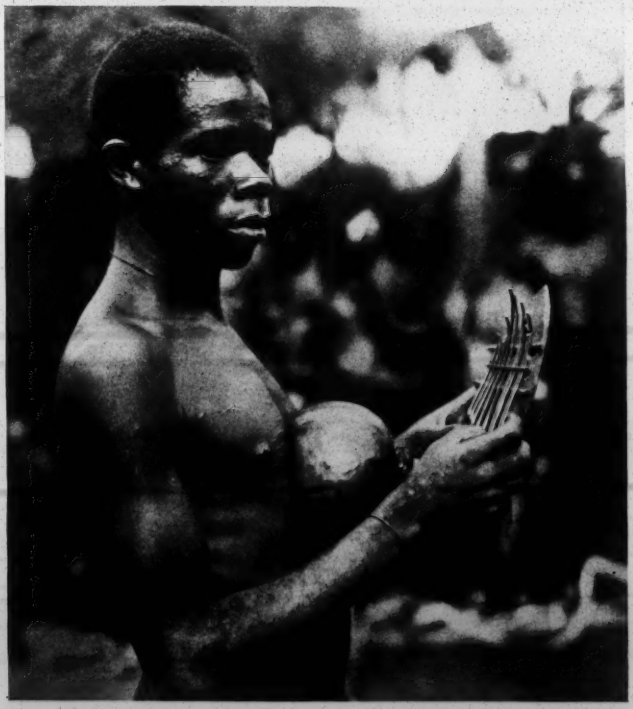

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A PIANIST OF AFRICA'S JUNGLES

The sounding box of his portable instrument is a gourd, and its strings are slips of bamboo. It is from the homeland of this Central African Paderewski that a Belgian expedition began its ascent of "The Mountains of the Moon" (See Bulletin No. 5).

HOW TEACHERS MAY OBTAIN THE BULLETINS

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The World's Newest State Name: Saudi Arabia

THE Kingdom of Saudi Arabia is the latest state name to take its place on the maps of the world and in the annals of history. The name has been officially conferred on the dual country that since 1927 has been known as "The Kingdoms of Hejaz and Nejd."

The name, "Saudi Arabia," tells the story of the carving out of a great Arabian state by a powerful dynasty. The present kingdom has a larger part of the peninsula of Arabia under one control than any state has had for centuries. Even under Turkey, before the World War, control was divided among scores of emirs and tribal leaders. Immediately after the World War the peninsula was rimmed with many narrow coastal states, independent of each other and of the Bedouin powers in the interior.

The Saud Family Came from Nejd

It was in Nejd, the great central plateau of Arabia, with its rocky wastes, its shifting sands, its scrub-covered wildernesses, and its oases, that the Saud dynasty arose. During the early part of the twentieth century the Saud family gained strength in Nejd. After the World War, Abdul Aziz ibn Saud, the present king of Saudi Arabia, gained complete control of his native Nejd and began extending his power toward Hejaz and its capital, holy Mecca. He captured that city in 1924 and has since steadily consolidated his huge dominion. Mecca and inland Riyadh have been mentioned as possible capital cities for the new kingdom.

Starting with Nejd, the new nation absorbed three of the "edge states" of the peninsula: Hasa on the east, and Hejaz and Asir on the west. On the south it is still fenced off from the Arabian Sea by British Aden and by the more or less independent states of Yemen, Hadhramaut and Oman. Saudi Arabia, however, covers by far the greater part of the peninsula. Of Arabia's 1,000,000 square miles, the new state embraces about 800,000, with a population close to 5,000,000.

It is a diverse country with diverse peoples, over which King Ibn Saud rules. Along the entire Red Sea coast of his domain are low broken ranges of mountains, extending inland 60 miles or more. Beyond this minor barrier a plateau region slopes gently toward the Persian Gulf. Many of the mountains are bare, but the higher Hejaz mountains south of Mecca and those of Asir have coffee and fruit trees on their slopes. Close to these mountains on the east lies a fertile strip of upland country, reasonably well watered.

Much of the New Nation Is Desert

Much of Saudi Arabia, however, is desert or almost barren wilderness, in which are scattered numerous oases, large and small. The gardens of these oases are usually watered from wells whose waters are drawn to the surface in leather buckets by plodding camels.

Along the sea coasts the natives engage in fishing. In the ports are traders and merchants whose ways of life have been affected to a certain extent by contacts with foreigners. The mountaineers of the east and south are distinct from the other tribesmen. They are a hardy and tough race, cruel in war.

The camels, sheep, and goats raised in the interior constitute one of the greatest sources of Arabia's wealth. Many are exported. Another source of income is the money spent by thousands of devout Mohammedans who come each year from all over the Islamic world to the holy shrines of Mecca and Medina. Because of upset

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© Photograph by Capt. A. W. Stevens

DEVIL'S ISLAND, THE MOST TALKED OF "PRISON" IN THE WORLD

In the foreground lies St. Joseph Island, largest of the penal group Iles de Salut, off the French Guiana coast. It contains the hospital and stores. Devil's Island itself is the small, palm-shaded isle in the background. The two, with Isle Royal, are 27 miles from the mainland (See Bulletin No. 3).

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Little Is Known about the Mysterious Cosmic Ray

GERMAN scientists in South America recently made studies of the cosmic ray on an Andean peak at an altitude of about 20,000 feet, the highest land station where these elusive members of the great family of rays have been observed. Other cosmic ray expeditions are at work, or have recently made studies, in Alaska, Europe, New Zealand, Australia, northern Canada and the United States.

When the results of observations taken during the August eclipse of the sun in New England are tabulated and studied, man may have another chapter to add to the meager amount already collected in regard to this most mysterious and least-known member of the ray family.

Studied from an Airplane 27,000 Feet up

The airplane which photographed the moon's shadow at a height of 27,000 feet, during the National Geographic Society-Army Air Corps eclipse expedition, took to that altitude a specially built electroscope which made automatic records of the intensity of the cosmic rays before, during and after the passage of the moon's shadow.

So little is known about cosmic rays that no one is willing to dogmatize about them. They seem to be the midget branch of the great family of rays or waves that surge through the universe. The giant branch of the family is made up of radio waves, some of them 15 miles and some less than an inch in length. Going down the scale, one encounters shorter waves which are heat rays, and then still shorter ones which are infra-red rays, still invisible.

When one passes to the next shorter rays something very unusual takes place. They suddenly become visible and are known as "light rays." These waves are so short that it would require a train of 63,000 violet waves or 32,000 red ones to equal one inch. It is only a tiny fraction of the ray family that is visible. The waves next shorter than light rays, ultra-violet rays, are again invisible.

Cosmic rays are believed by one school of thought to be waves almost inconceivably shorter than light rays. Going down through ultra-violet and X-rays one comes to the gamma rays given off by radium. Of these, from 180 million to 20 billion would be required to equal one inch. Cosmic rays are still shorter. They are estimated at from 25 billion to 2,000 billion to the inch.

Will Penetrate Twenty Feet of Lead

Among the few things known about cosmic rays is their great penetrative power. This is detected by their effect on very delicate electroscopes. It has been found that the rays will penetrate 200 feet of water or 20 feet of lead.

Despite the penetrative power of cosmic rays, however, they seem to be screened out to a certain extent in their long journey through the earth's atmosphere. It has been found that the intensity of the radiation is much greater high above the earth than at the earth's surface. In fact, the intensity increases rapidly as instruments rise higher and higher, but the rate of increase falls off after an altitude of 39,000 feet (more than seven miles) is reached.

Recording instruments have been recovered from an unmanned balloon which rose to a height of 92,000 feet (nearly 17½ miles). At that altitude the increase in intensity of cosmic rays had slowed down very much.

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economic conditions, this stream of pilgrims has fallen off, and as a result Saudi Arabia also has its depression.

Under King Ibn Saud, the new state has progressed politically, physically, and socially. Perhaps his greatest contribution has been socially, for to a considerable extent he has solved the problem of the restless Bedouin. He established villages wherever water could be found, and has "planted" tribes of wanderers, helping them to establish agricultural communities. To each such group he has sent educated men to teach them "their duties to God and king and country." All over the country schools have been increased in numbers.

The physical changes have been most startling. Lumbering camels, which for centuries have carried wealthy pilgrims from the coast to Mecca, now must compete with motor buses. Automobiles have reached even into the wilderness stretches; but they must travel on sandy tracks, for good roads have not yet come to Arabia.

Airplanes scout for the army of Saudi Arabia. Wireless stations send out their dots and dashes from the key oases of the interior and from the leading ports, and their towers have been set up in holy Mecca itself.

In introducing these modern devices, King Ibn Saud found himself in conflict with the religious leaders of his country. But he insisted that there is nothing in the religion or laws of Islam justifying an attitude opposed to science. He cited the glorious days of high Arabian culture under the early caliphs when, during the seventh and eighth centuries, the Mohammedan world actually kept science alive for darkened Europe. He won his point and the innovations have gone on.

Note: For new material about the isolated region along the southern border of Saudi Arabia, and photographs of recently discovered Arab cities with "set-back skyscrapers" a century old, see "Into Burning Hadhramaut," *National Geographic Magazine*, October, 1932. See also "A Visit to Three Arab Kingdoms," May, 1923; and (for northern Arabia) "The Citroën-Haardt Trans-Asiatic Expedition Reaches Kashmir," October, 1931. The following GEOGRAPHIC NEWS BULLETINS also deal with Arabia: "Bertram Thomas, Lone Eagle of the 'Singing Sands,'" January 11, 1932; "Arabia's Blank Spot Explored at Last," March 16, 1931; and "Jidda, Gateway to Industrial Revolt in the Desert," January 26, 1931.

Bulletin No. 1, November 14, 1932.

© *Photograph by Mrs. Frederick Simpich*

IN NORTHERN ARABIA THE MULE CARAVAN IS THE CHIEF MEANS OF TRANSPORT

Much of the new Kingdom of Saudi Arabia is an unknown land to those of the Western World, although a few of our inventions—the motor car, the airplane, wireless, etc.—are coming into daily use. King Ibn Saud travels by motor car, receives reports from outlying districts by airplane, and has erected a wireless station in the Holy City of Mecca.

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Devil's Island, Lonely but Not as Terrifying as Pictured

SIX men who said they had escaped from the dread "Devil's Island," penal colony in French Guiana, put into the harbor of Willemstad, Curaçao, in a sailing canoe recently. They were detained by the Dutch authorities as "unadmitted foreigners without proper identification papers"—a rather commonplace ending for what is considered the most difficult of "jail breaks."

Napoleon III called Devil's Isle the "Dry Guillotine," and in recent decades writers of fantastic tales have painted terrifying word-pictures of the island, many of which have been misleading.

Sometimes Fewer Than a Dozen Inhabitants

Instead of an arid, sun-scorched rock or an almost impenetrable jungle area, Devil's Isle is a tiny green spot rising out of the Atlantic, 27 miles off the French Guiana coast, and is dominated by groves of lofty coconut trees.

Nor is Devil's Isle over-populated. It is reserved for political prisoners who have been sentenced to life imprisonment. In recent years there have at times been fewer than a dozen prisoners on the island.

With its neighbors, Isle Royale and St. Joseph's Island, Devil's Island makes up the Îles de Salut (Isles of Salvation). Tier upon tier of prison buildings rise on Isle Royal to which incorrigibles from other French Guiana prisons are sent for discipline. On St. Joseph's are hospital and administration buildings.

Life Prisoners Live in Cabins

Life on Devil's Isle is far less rigorous than at the other French Guiana convict establishments. There are no dungeons, barred windows or high walls. The "lifers" live in small cabins, wear their own clothing, and are allowed their own books and newspapers.

Although the island is only about 400 miles north of the Equator, sea breezes cool the atmosphere and make it more healthful than many settlements along the swamp-fringed, jungle-clad mainland.

Nearly the entire foreign population of French Guiana is made up of men and women who have been convicted of crimes in the French courts. In the coast towns and in the hinterland farming and mining regions live the *libérés*—convicts whose days of confinement have ended.

Convicts who are sent to French Guiana for more than eight years must remain for life. A man sentenced for a lesser period, however, must spend one year in the colony for every year spent behind prison walls before he can return to France. Then he or his family or friends must pay his way home, or he ends his days in the colony.

A Medley of Professions and Races

Libérés in French Guiana run the gamut of the professions and trades. On the streets of Cayenne, site of one of the colony's largest prisons, stroll lawyers, doctors, engineers and artists as well as peasants and former habitués of the slums of Paris and Marseille. Many are Senegalese, Arabs, Hindus and Indo-Chinese.

The *libérés* are permitted to work for wages. Some of them are in partnership with natives, some operate small shops, while others spend their time carving figures of animals, women and birds out of hardwood.

Colonizers have attempted to settle French Guiana but have failed. Thousands of *libérés* also have been sent to regions where the government hoped for agricul-

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Several theories have been advanced as to the origin of cosmic rays. When their existence was discovered about eighteen years ago it was thought that they might come directly and only from the sun of our solar system. But this was soon proved to be wrong, for it was demonstrated that the rays flow in from space in equal volume day and night, and apparently from directly overhead.

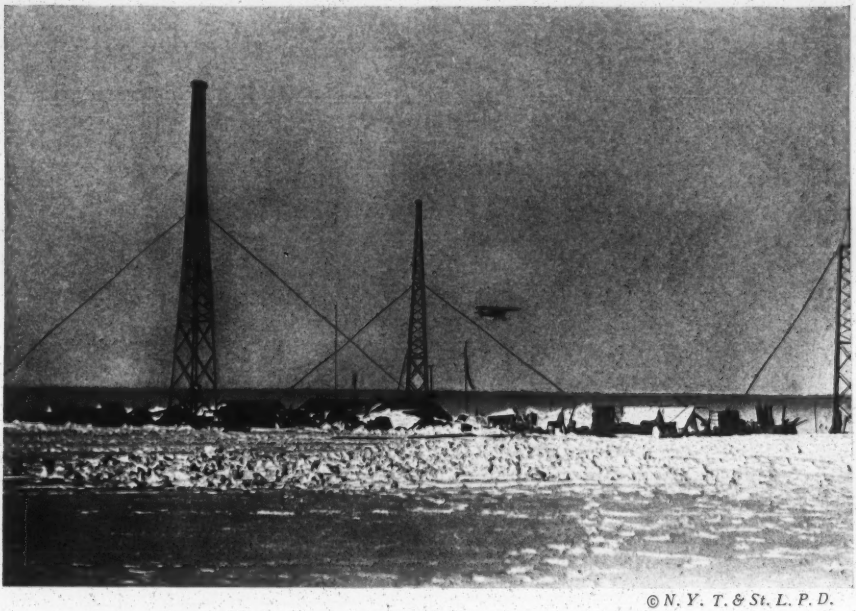
Come from Empty Sections of Space

Then it was believed that they might come from all suns; but tests show that they seem to come from the directions of the comparatively empty sections of space, as well as from the directions of the more crowded star clusters.

One theory advanced is that the rays arise when electrons, streaming in from the sun almost at the speed of light, strike atoms of gases in the earth's atmosphere. Another suggestion is that the rays are by-products from the creation of new atoms, such as helium and oxygen, from electrons of space. But these are only scientific guesses. The origin of cosmic rays remains so far a mystery.

Note: See also "Photographing the Eclipse of 1932 from the Air" and "Observing a Total Eclipse of the Sun," *National Geographic Magazine*, November, 1932; and "Interviewing the Stars," January, 1925.

Bulletin No. 2, November 14, 1932.



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RADIO WAVES KEPT "LITTLE AMERICA" IN TOUCH WITH CIVILIZATION

This giant member of the great family of rays is the most distant cousin of the little-known cosmic ray. Radio waves, some of them 15 miles and some less than an inch in length, have been put to work for man. To the lonely Antarctic they carried voices, messages and music to cheer the gallant crew that was first to achieve the South Pole by air.

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The Romantic Ohio Now a Busy Artery of Trade

LA SALLE, the French explorer, who was the first white man to see the Ohio, called it "La Belle Rivière" or the "Beautiful River." The Ohio still has many forest-lined reaches of matchless beauty, but, as one of our chief arteries of commerce, it to-day more nearly lives up to the meaning of its Iroquois Indian name, "Great River." Last year more than 41,000,000 tons of freight moved over the Ohio River and its tributaries.

Unromantic barge lines have replaced the flatboats, "broadhorns," and majestic stern-wheelers of another day, and U. S. Army engineers have removed many hazards, which once added the zest of danger to a journey on the river, by dredging a nine-foot channel from Pittsburgh to Cairo and by rebuilding the dams and locks at Louisville.

Federal Program Dates Back to 1827

Building of the Ohio's fifty locks began under President Hayes in 1879, but the Federal Government's first effort to improve the river dates back to 1827. Four kinds of boats may well unfold the four main chapters of the Ohio's dramatic transformation from a river into a waterway.

Four kinds of boats—and the only thing they have in common is that they float! For 100 years after the Ohio's discovery by La Salle in 1670, the native Indian canoe reigned supreme. The flatboat succeeded the canoe for fifty years. Then boat building flowered in the "floating palace" steamboats of Mark Twain's boyhood. To-day the Ohio River is chiefly a waterway for barges.

The Ohio River's story falls easily into pageants. First came Monsieur Céloron de Bienville, with a fleet of canoes carrying 200 Indians and soldiers of France. He turned his fleet to shore, drew up his "army" in battle array, and hammered a plate with the arms of France to a tree.

New Orleans and Kentucky "Broadhorns"

The stage of the next "float" is about 40 feet long and 12 feet wide. It is the deck of a Kentucky "broadhorn." It has a roof over half its deck; if the roof covered the whole deck it would be a New Orleans broadhorn. A boat must be better made to go 'way down to New Orleans.

Under the roof a woman feeds wood into a small clay fireplace. Other women passengers help prepare the evening meal. They work amid a clutter of chests and chairs destined for pioneer homes as yet unbuilt. The deck and the sides of a broadhorn provided floors for prairie cabins.

One man is at the stern steering with a 40-foot oar. Another in the bow holds a "gouger," a short oar for use in swift water. In one hand he holds a horn which he blows to warn traffic ahead.

The third boat of the Ohio's four cycles is the steamboat. Steamboats still ply the river but they cannot to-day make the impression that they made on Mark Twain and his contemporaries.

"The steamboats were finer than anything on shore," he wrote. "Compared with superior dwelling-houses and first-class hotels in the Valley they were palaces. They tallied with the citizen's dream of magnificence; chimney tops cut to counterfeit a spraying crown of plumes; pilot-house, hurricane deck, boiler-deck, guards, all garnished with white wooden filigree work of fanciful patterns, gilt deer horns over the big bell, oil pictures on every stateroom door, big chandeliers every little

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tural and mining development, but only a few have remained or lived to return to the coast. Nearly all the former prisoners cling to the coast towns, eking out a bare existence until death or the judgment of the French court has been satisfied.

Escape from the colony by land is almost impossible, for it is hemmed in by jungles infested with vicious snakes and wild animals. Convicts who reach Brazil, British Guiana, and Dutch Guiana usually are caught and returned.

Note: For supplementary references about Devil's Island, the Guianas and other regions along the northern coast of South America see: "In Humboldt's Wake," *National Geographic Magazine*, November, 1931; "Skypaths through Latin America," January, 1931; "Through Brazil to the Summit of Mount Roraima," November, 1930; and "To Bogotá and Back by Air," May, 1928.

For illustrations and material about hitherto-unknown life in the tree-tops of the Guiana jungles see: "A New World To Explore," November, 1932.

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A special binder for GEOGRAPHIC NEWS BULLETIN which will hold thirty issues (a complete year's edition) is now available. This holder consists of a handsomely embossed brown cover and spring jaws which grip hard and hold fast one, two or any number of BULLETINS up to a full year's allotment. When a single BULLETIN is required elsewhere, release is immediate, replacing equally easy while other BULLETINS remain undisturbed in numerical order as they were. BULLETINS are not punched or marred in binding.

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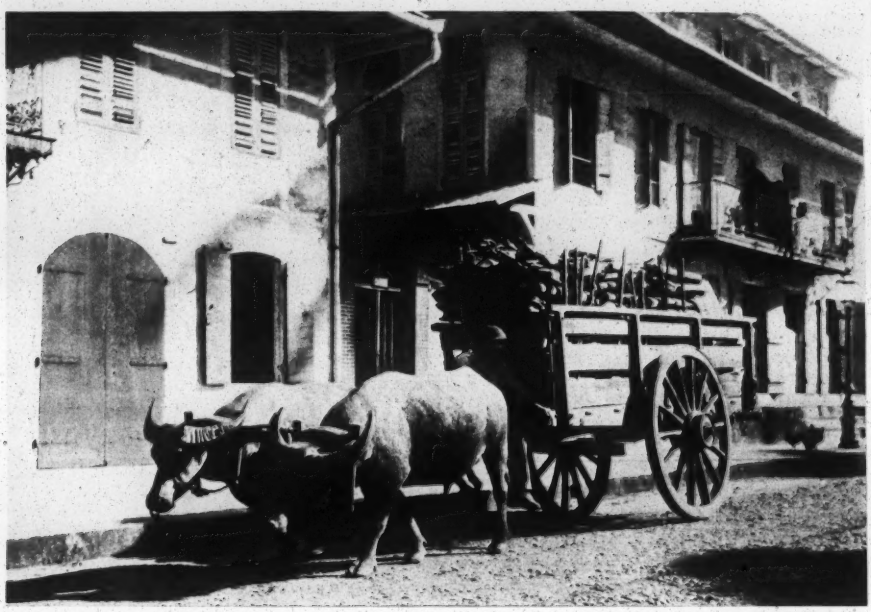
Bulletin No. 3, November 14, 1932.



© *Photograph by Capt. A. W. Stevens*

A RELEASED CONVICT PEDDLES WOOD IN CAYENNE

When he has served his term the *libéré* must remain in French Guiana a number of years equal to his original sentence before he may return to France or to other countries. The bitter struggle to earn a livelihood is almost as great a punishment as confinement on Devil's Island.

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Ruwenzori Range, Africa's Queer "Mountains of the Moon"

THE world's queerest mountain mass, Ruwenzori in Central Africa, known in ancient times as the "Mountains of the Moon," has again been scaled.

A Belgian expedition recently made the first ascent of the lofty range from the west side, and climbed a 16,700-foot peak, hitherto unknown, which they named Point Albert, in honor of their king.

Snow and Ice Surrounded by Tropical Jungle

Ruwenzori is unusual in its very situation. It lies almost on the Equator, is surrounded by rank, steaming tropical forests and sun-drenched plains covered with tall elephant grass, and yet it pushes its peaks up to eternal snows. Nowhere else are there comparable heights under the Equator, rising from the heart of a continent. The Andes of Ecuador, close to the coast, and the mountains of the island of New Guinea, are the nearest competitors.

Weather conditions play a part in the strange geographical drama of this African mountain mass and in throwing an almost literal veil of mystery around it. The peaks are hidden to observers from the plains and forests by clouds and fog except at rare intervals.

As a result, the mountains were almost unknown to Europeans until 1864 when Sir Samuel Baker, while exploring Lake Albert, saw "a blue mountain to the south." In 1887 Stanley saw the peaks and made known the fact, for the first time, that they were snow-capped. It was not until more than a decade later that the snow-line was first reached; and the crests were not attained until 1906, when the Duke of the Abruzzi led his expedition to the top.

"The name, Mountains of the Moon, is believed to have arisen from a mistaken translation from Arabic; but it has fitted well into the atmosphere of mystery that surrounded Ruwenzori for centuries; and it is justified somewhat by the weird appearance of the mountain slopes. The relatively few white men who have made the arduous climb have all noted the impression that they had blundered into some alien world. The combination of excessive moisture, altitude and equatorial sun has produced a unique and fantastic vegetation.

Parsley Plants Nine Feet High!

"After emerging from the dense tropical forests of the lower slopes, a climber feels like a Lilliputian visiting the meadows of Brobdingnag. He walks among parsley plants nine feet high, 'bird-seed' three times his height, and heather plants, relatives of the low Scottish shrub, that have expanded into great trees 70 and 80 feet tall. To add to the weirdness, colored mosses—brown, yellow, green, white and red—are all about under foot and overhead. They grow in huge cushions that encircle the limbs of the heath trees like giant mushrooms impaled on a skewer.

The unearthly appearance is heightened usually by fog, through which the strange growths loom dimly; and there is a continual drip of water from limbs and moss clumps. The way often leads through swamps and muck up to one's knees.

"Above the heath forests, on less swampy ground, giant lobelias cover large areas, sending their spikes up to twenty feet or more. All about are a variety of weeds, grown almost to the magnitude of trees. Farther up are thickets of bamboo through which progress is extremely difficult. The highest slopes, just below the snow line, are covered with a thick growth of everlasting flowers.

"Except on its lowest slopes, Ruwenzori is uninhabited, and above the tropical forests there is not much animal life. The soggy heath forests are almost devoid of animals, birds and insects. On other parts of the slopes, where sparse animal life is found, it forms a queer assortment: a few small mountain antelopes; leopards that prey on them; hyraxes, which are harelike conies; fruit-eating bats with a 'wing-spread' of two feet; and a few birds and insects.

"The name, Ruwenzori, was selected by Stanley as the most common among a large number of native designations. It has been interpreted as meaning 'King of the Clouds' and 'Rain-maker.'

Really a "Pocket-Size" Range

"Ruwenzori is not a single mountain, but a 'pocket-size' range. With its foothills, it is about 60 miles long and 30 miles wide. The naming system is rather complex. Topping the mountain mass are six explored groups of snowy peaks, and a few other heights not yet climbed. Each *group* is given a name as a mountain, and each peak is then separately named.

"From north to south the snowy mountain groups which have been climbed are Emin, Gessi, Speke Stanley, Baker, and Luigi di Savoia, each named for an explorer of Ruwenzori

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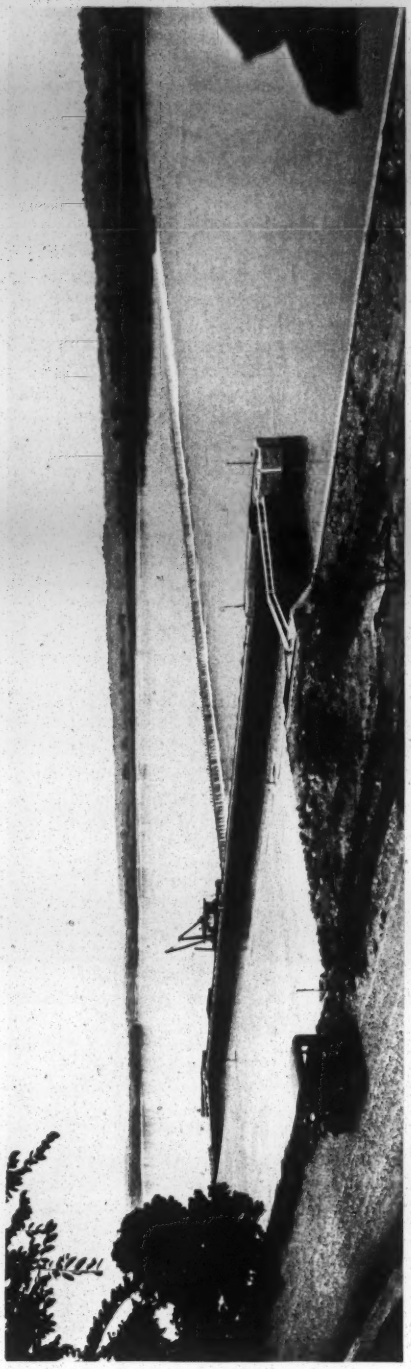

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A "HOUSE OF CARDS" DAM THAT CAN BE DROPPED WHEN FLOOD WATERS RUSH DOWN THE OHIO

Between Pittsburgh and Cairo more than two score barriers of this type have been built by the Corps of Engineers, U. S. Army. They consist of a row of heavy oak panels, hinged to a concrete base. When the river rises above the 9-foot stage a barge releases props under the panels, which fall flat to the river bottom. When the river returns to its normal level the dam is pulled up into position again.

way, each an April shower of glittering glass-drops."

Mark Twain, Steamboat Pilot

At Cincinnati, on the Ohio, Mark Twain embarked on his career as a river steamboat pilot. The Civil War, which wiped out the steamboat era, took his job, too. At one time two-thirds of the steamboat tonnage of the United States was on the Middle West rivers. On the Ohio and other Mississippi tributaries there were more steamboats than in all the ports of Great Britain.

The cargo barge is the last of the four boats that have figured in the Ohio's story. Few people see the modern cargo boat pageant which floats by every day. This parade passes at any one of the locks between Pittsburgh and Cairo; locks which are 110 feet wide (the width of Panama Canal locks) and 600 feet long.

The chief actor in the Ohio's modern pageant is a staunch tow boat steaming 'round the bend. Like a hen with too many chicks, it approaches the lock dragging twelve barges, four abreast. They are loaded not with fur; not with pioneers. They are not "floating palaces." They carry coal from Kanawha, steel from Pittsburgh, clay products from East Liverpool, and other bulky commodities of a score of river ports, from the mountains of West Virginia to the plains of Illinois' "Little Egypt."

Note: See also: "Ohio, Mother of the West," *National Geographic Magazine*, May, 1932; "Illinois, Crossroads of the Continent," May, 1931; "George Washington's Travels," January, 1932; and "Pirate Rivers and Their Prizes," July, 1926.

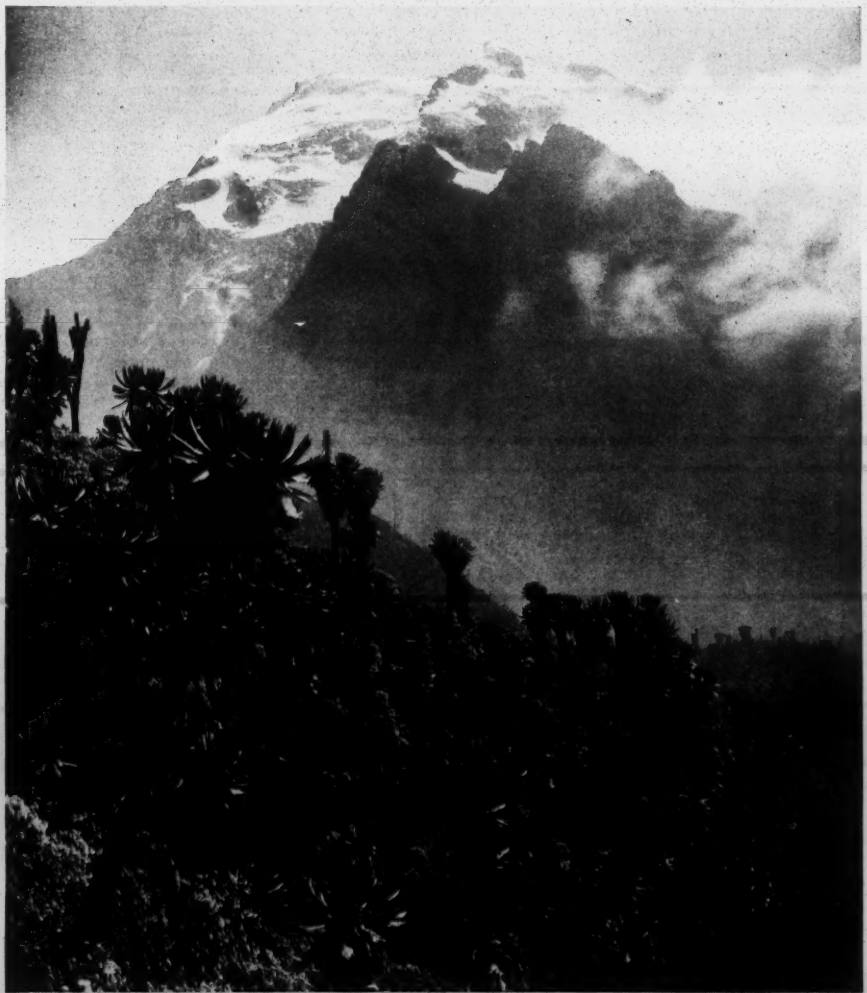
Bulletin No. 4, November 14, 1932.

itself or of neighboring portions of Africa. Mount Luigi di Savoia bears the name of the Duke of the Abruzzi. Mount Stanley is the highest of the six snow-capped groups. All four of its peaks—Margherita, Alexandra, Elena, and Savoia—are more than 16,000 feet high, and exceed by several hundred feet the peaks of the neighboring groups. Margherita Peak forms the crest of Ruwenzori, with an altitude of 16,815 feet above sea level.

"Numerous small glaciers extend down from the snowy peaks to about the 14,000-foot level, and from them trickle many streams. From whichever side the drainage comes, it finds its way into the surrounding lakes and rivers, and flows, through Lake Albert, into the Nile. Ruwenzori thus fulfills ancient tradition: it is the 'Mountain of the Moon' on whose white crests Egypt's life-giving river is born."

Note: For additional reading see: "Cairo to Cape Town, Overland," *National Geographic Magazine,* February, 1925; "African Scenes from the Equator to the Cape," October, 1922; and "The Fight at the Timber Line," August, 1922.

Bulletin No. 5, November 14, 1932.



© Photograph by Vittorio Sella

SNOW-CLAD PEAKS OF THE RUWENZORI, ALMOST ON THE EQUATOR

The strange trees in the foreground are overgrown plants which are close relatives of our common cardinal flower, golden ragwort, etc. Here ordinary bird seed reaches a height of sixteen feet, and Scotland's heather is a bulky tree no Scotchman would recognize.